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Good intents, but low impacts

Diverging importance of motivational and socio-economic determinants explaining pro-environmental behavior, energy use, and carbon footprint

Stephanie Moser[1]

Silke Kleinhückelkotten[2]

[1] Centre for Development and Environment, University of Bern

[2] Ecolog-Institut, Hannover

Symposium ‚Take a walk on the green side! Predicting pro-environmental attitudes and behaviors'
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Ongoing trend of over-consumption of natural resources

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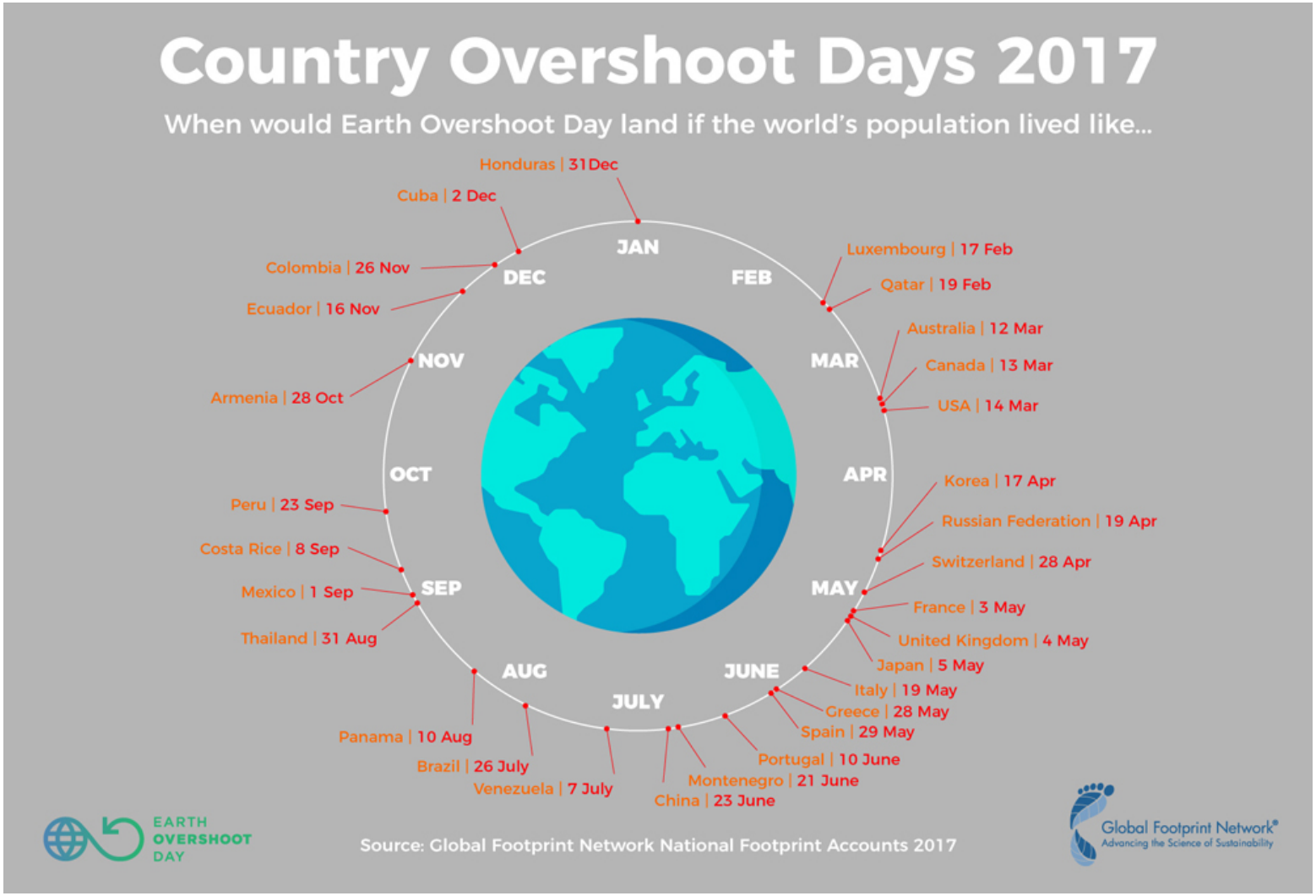
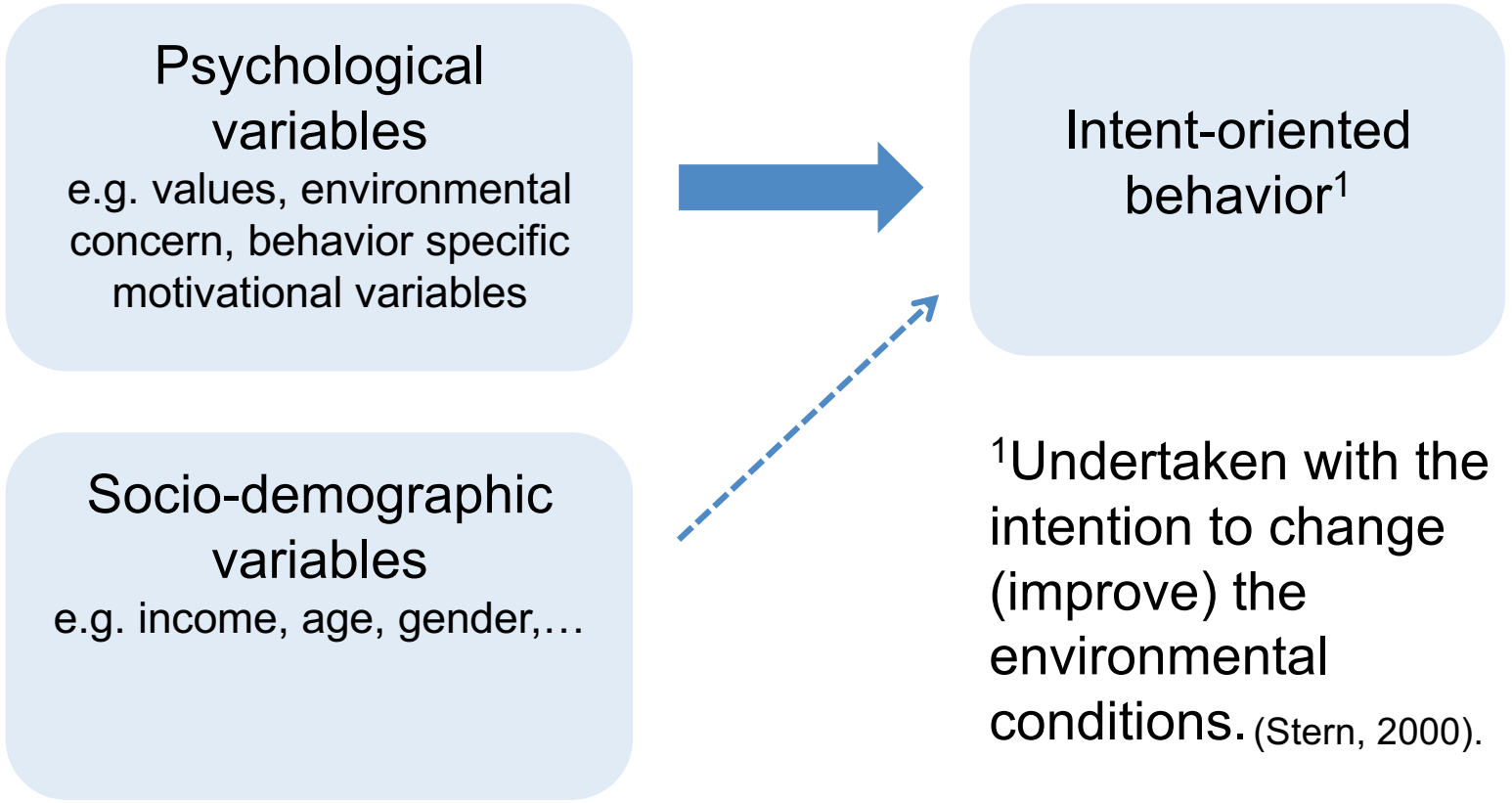


Diverging determinants of intent-oriented and impact-oriented behavior



[1]Undertaken with the intention to change (improve) the environmental conditions. (Stern, 2000).

Diverging determinants under an intent-oriented or impact-oriented behavior perspective

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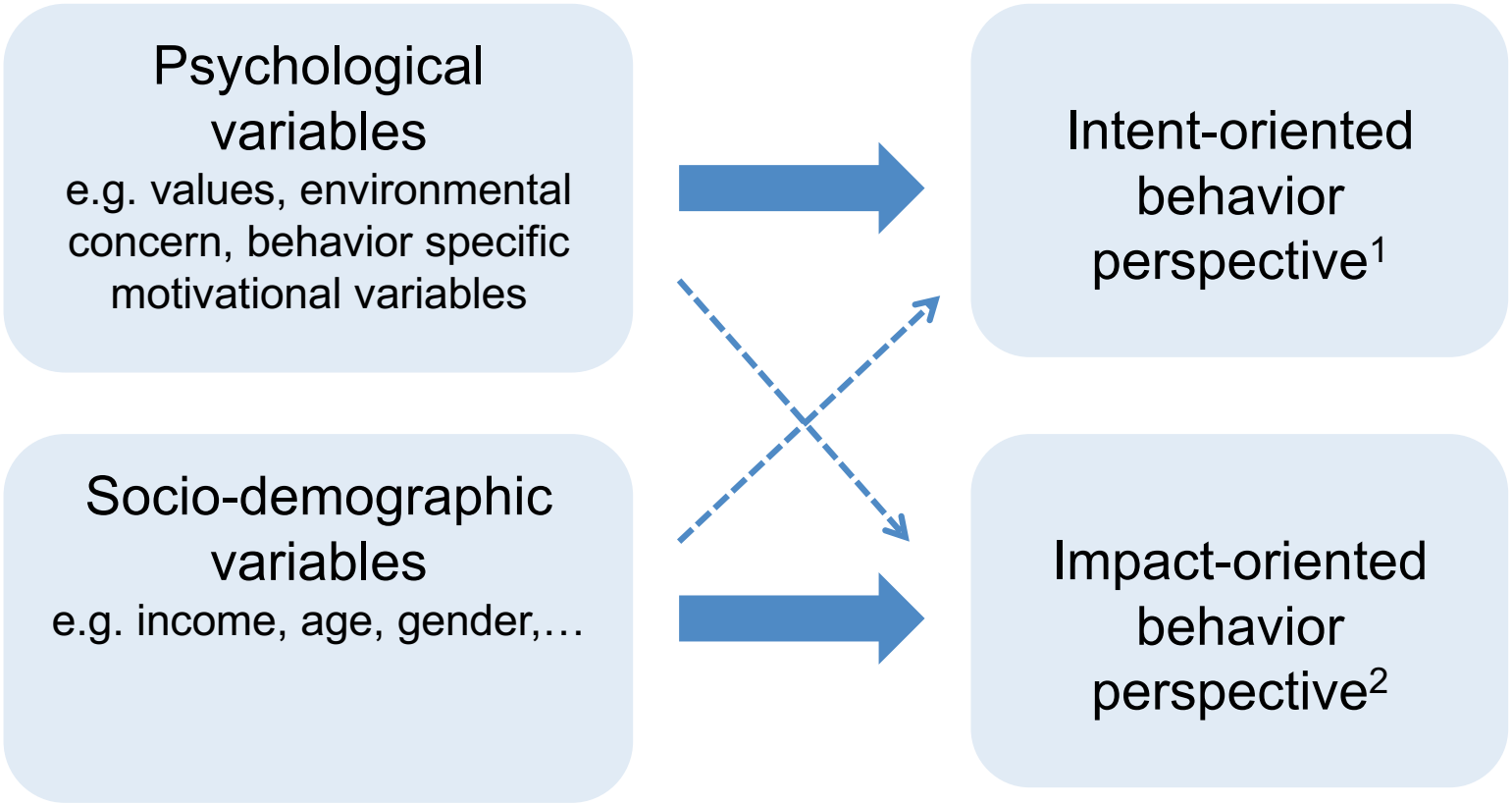

[2]Extent to which the availability of materials or energy from the environment is changed, or the structure and dynamics of ecosystems or the biosphere is altered (Stern, 2000).

(e.g. Abrahamse & Steg, 2009; Csutora, 2012; Gatersleben, et. al., 2002; Kennedy et al., 2013; 2014).

The Present Study

Overall Aim:

Describe and explain individual differences in the consumption of natural resources (in particular energy use and greenhouse gas emissions).

Aim of this Study:

Explore the diverging insights that emerge from the intent-oriented and impact-oriented research perspectives vis-à-vis environmentally significant behavior.

⇒ Does environmental self-identity explain variance not only in intent-oriented behavior, but also in impact-oriented behavior over and above socio-demographic characteristics?

— Environmental self-identity (Gatersleben, et al., 2012; Van der Werff et. al. 2013; Whitmarsh & O'Neill, 2010)

Method: Survey Procedure

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- March / April 2014
- By a Market Research Institute (GfK)
- Face-to-face interviews with CAPI (Computer Assisted Personal Interview) ~ 45min
- German speaking residents > 18 years
- Recruitment within an existing participant pool stratified for age, gender, household size, based on national proportions.

Method: Sample Characteristics

N = 1‘012

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Slightly under represented: High incomes
Slightly over represented: Medium incomes

Slightly under represented: Higher education
Slightly over represented: Low and medium education

Characteristics	*M*	*SD*	%
Age in years	49.8	17.6	
Net monthly per capita income in € (income)	1,186.7	624.3	
Number of household members	2.5	1.2	
Gender			
Male			49.1
Female			50.9
Highest education level completed (education)			
Secondary school			39.5
Intermediate school			32.7
Higher education entrance qualification			20.7
Higher education			5.6
Missing			1.5
Home ownership			
Rental			72.2
Owns home			27.8
Residential area			
Urban			59.2
Rural			40.8

(Moser & Kleinhückelkotten, 2017, Table 1)

Method: Measures

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	Impact	Intent
Overall	• Overall energy use (kWh/a) • Carbon footprint ($kgCO_2e/a$)	• Self-reported pro-environmental behavior (two items, α = .76)
Housing	• Living space (m^2) • Number of energy-consuming appliances	• Number of energy-efficient appliances
Food	• Meat consumption	• Importance of organic food
Mobility	• Distance in passenger car (km/a) • Distance vacation trip (km)	-

	Socio-demographics	Psychological
	Age, Gender, Education, Income, Household size, Home ownership,	• Environmental self-identity (two items, α = .74)

Predicting impact-oriented vs. intent-oriented behavior I

	Pro-environmental behavior			Overall energy use (kWh/a)			Carbon footprint ($kgCO_2e/a$)		
	B	*SE*	β	*B*	*SE*	β	*B*	*SE*	β
Constant	1.10	0.16		4.17	0.05		3.68	0.05	
Age	0.00	0.00	.00	0.00	0.00	−.12**	0.00	0.00	−.13***
Gender (male = 0)	−0.05	0.04	−.03	−0.06	0.01	−.13***	−0.06	0.01	−.16***
Education	−0.04	0.03	−.04	0.00	0.01	−.02	0.00	0.01	.00
Income	0.00	0.00	−.01	0.00	0.00	.25***	0.00	0.00	.27***
Number of household members	−0.01	0.03	−.01	−0.02	0.01	−.10*	−0.02	0.01	−.09*
Owns home (rental = 0)	−0.07	0.05	−.03	0.10	0.02	.22***	0.08	0.01	.19***
Urban vs. rural region	0.07	0.04	.04	0.00	0.01	.01	0.00	0.01	−.01
Environmental self-identity	0.66	0.02	.70***	−0.02	0.01	−.09**	−0.02	0.01	−.08**
R^2/R^2adj		.52/.51			.19/.19			.20/.19	
F		123.03***			27.46***			28.97***	
N		934			935			935	

(Moser & Kleinhückelkotten, 2017, Table 3)

SI & PEB: low values = high SI /PEB
OE & CF: low values = low impact

Predicting impact-oriented vs. intent-oriented behavior II

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	Living space (m^2)			Household appliances (kWh/a)			Energy-efficient appliances		
	B	*SE*	β	*B*	*SE*	β	*B*	*SE*	β
Constant	1.63	0.03		3.00	0.05		1.50	0.20	
Age	0.00	0.00	.10***	−.00	0.00	−.09*	−.01	0.00	−.18***
Gender (male = 0)	0.01	0.01	.03	.00	0.01	.00	.14	0.05	.08**
Education	0.01	0.00	.03	−.02	0.01	−.09**	−.02	0.03	−.02
Income	0.00	0.00	.21***	.00	0.00	.09*	.00	0.00	.21***
Number of household members	−0.09	0.00	−.58***	−.08	0.01	−.42***	−.16	0.03	−.22***
Owns home (rental = 0)	0.15	0.01	.37***	.01	0.02	.02	.30	0.06	.16***
Urban vs. rural region	0.01	0.01	.02	−.00	0.01	−.01	−.06	0.05	−.03
Environmental self-identity	−0.01	0.00	−.04*	−.03	0.01	−.13***	−.13	0.03	−.15***
R^2/R^2adj		.65/.64			.22/.21			.19/.18	
F		209.10***			32.79***			25.06***	
N		927			935			892	

(Moser & Kleinhückelkotten, 2017, Table 4)

SI: low values = high SI
LS & HA: low values = low impact
EEA: low values = low impact

Predicting impact-oriented vs. intent-oriented behavior III

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	Meat consumption			Organic foods			Car trips (km/a)			Vacation trips (km)		
	B	*SE*	β	*B*	*SE*	β	*B*	*SE*	β	*B*	*SE*	β
Constant	3.26	0.22		2.73	0.17		0.83	0.42		3.56	0.44	
Age	0.00	0.00	.02	0.00	0.00	−.04	−0.01	0.00	−.10**	0.00	0.00	−.05
Gender (male = 0)	0.59	0.06	.32***	−0.21	0.04	−.14***	−0.58	0.11	−.15***	0.04	0.11	.02
Education	−0.02	0.04	−.02	−0.11	0.03	−.13***	−0.13	0.07	−.06	0.02	0.07	.02
Income	0.00	0.00	−.04	0.00	0.00	−.05	0.00	0.00	.43***	0.00	0.00	.41***
Number of household members	−0.07	0.03	−.09*	−0.04	0.03	−.05	0.84	0.07	.48***	0.20	0.07	.17**
Owns home (rental = 0)	−0.01	0.07	−.01	−0.24	0.05	−.14***	0.42	0.14	.10**	0.19	0.13	.07
Urban vs. rural region	0.08	0.06	.04	−0.08	0.04	−.05	0.32	0.11	.08**	−0.24	0.11	−.09*
Environmental self-identity	−0.09	0.03	−.09**	0.32	0.02	.39***	−0.22	0.06	−.11***	0.04	0.06	.03
R^2/R^2adj		.13/.12		.27/.26			.34/.33			.15/.14		
F		16.97***		42.90***			55.56***			10.23***		
N		934		475	934		891			475		

(Moser & Kleinhückelkotten, 2017, Table 5)

SI & OF: low values = high SI & OF
MC: low values = high impact
CT & VT: low values = low impact

Discussion

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In sum we found …

- Environmental self-identity predicts intent-oriented behaviors (PEB, EE appliances, organic food)
- But plays an ambiguous role in explaining the environmental impact of a person
- Income plays the major role in predicting environmental impact, but is not the only relevant socio-demographic predictor

⇒ Good intents but low impacts:
Pro-environmentally motivated people try to reduce their energy consumption and greenhouse gas emissions but they remain with low impact behaviors.

Discussion

⇒ Pro-environmentally motivated people try to reduce their energy consumption and greenhouse gas emissions but they remain with low impact behaviors.

Potential explanations:

> Lacking knowledge about the impacts of environmentally-friendly behavior => wrong decisions? (Csutora, 2012)

> Psychological variables => easy behaviors, structural factors => difficult behaviors (Whitmarsh, 2009)

> Going together of materialistic beliefs and environmental concern (Gatersleben et al. 2010)

⇒ efficiency, but no sufficiency measures?

⇒ Individuals' pro-environmental motivation is overridden by the overall effect of various consumption options that open up with higher socioeconomic status.

Implications

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- Does environmental-psychological research focus on the relevant behaviors?
- Does environmental-psychological research focus on the relevant target groups?
- Which theories and concepts help us to go beyond single behavior and rather investigate / changing lifestyle patterns?
- How may western living standards / subjective well-being be decoupled from environmental impact?

Thank you for your attention!

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For questions and comments:

stephanie.moser@cde.unibe.ch

Publications:

> Kleinhückelkotten, S., Neitzke, H.-P., & Moser, S. (2016). *Repräsentative Erhebung von Pro-Kopf- Verbräuchen natürlicher Ressourcen in Deutschland (nach Bevölkerungsgruppen). Texte | 39/2016*. Dessau-Rosslau: Umweltbundesamt.

> Moser, S., & Kleinhückelkotten, S. (2017). Good Intents, but Low Impacts: Diverging Importance of Motivational and Socioeconomic Determinants Explaining Pro-Environmental Behavior, Energy Use, and Carbon Footprint. *Environment and Behavior*, DOI:10.1177/0013916517710685

> Moser, S., Lannen, A., Kleinhückelkotten, S., Neitzke, H. P., & Bilharz, M. (2016). *Good intentions, big footprints: Facing household energy use in rich countries* (CDE Policy Brief No.9). Bern: CDE.

References

- Abrahamse, W., & Steg, L. (2009). How do socio-demographic and psychological factors relate to households' direct and indirect energy use and savings? *Journal of Economic Psychology, 30*(5), 711-720.
- Csutora, M. (2012). One More Awareness Gap? The Behaviour–Impact Gap Problem. *Journal for Consumer Policy, 35*, 145-163.
- Gatersleben, B., Murtagh, N., & Abrahamse, W. (2012). Values, identity and pro-environmental behaviour. *Contemporary Social Science*, 1-19. Gatersleben, Birgitta, Steg, Linda, & Vlek, Charles. (2002). Measurement and Determinants of Environmentally Significant Consumer Bahvior. *Environment and Behavior, 34*(3), 335-362.
- Gatersleben, B, Steg, L, & Vlek, C. (2002). Measurement and Determinants of Environmentally Significant Consumer Bahvior. *Environment and Behavior, 34*(3), 335-362.
- Kennedy, E. H., Krahn, H., & Krogman, N. T. (2014). Egregious Emitters Disproportionality in Household Carbon Footprints. *Environment and Behavior, 46*(5), 535-555. Kennedy, Emily H., Krahn, Harvey, & Krogman, Naomi T. (2014). Egregious emitters: Disproportionality in household carbon footprints. *Environment and Behavior, 46*(5), 535-555.
- Moser, S., & Kleinhückelkotten, S. (2017). Good Intents, but Low Impacts: Diverging Importance of Motivational and Socioeconomic Determinants Explaining Pro-Environmental Behavior, Energy Use, and Carbon Footprint. *Environment and Behavior*, DOI:10.1177/0013916517710685
- Moser, S., Lannen, A., Kleinhückelkotten, S., Neitzke, H. P., & Bilharz, M. (2016). *Good intentions, big footprints: Facing household energy use in rich countries* (CDE Policy Brief No.9). Bern: CDE.
- Whitmarsh, L, & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology, 30*(3), 305-314.
- Whitmarsh, L. (2009). Behavioural responses to climate change: Asymmetry of intentions and impacts. *Journal of Environmental Psychology, 29*(1), 13-23.
- van der Werff, E, Steg, Li, & Keizer, K. (2013). It is a moral issue: The relationship between environmental self-identity, obligation-based intrinsic motivation and pro-environmental behaviour. *Global Environmental Change, 23*(5), 1258-1265.

Overall Consumption

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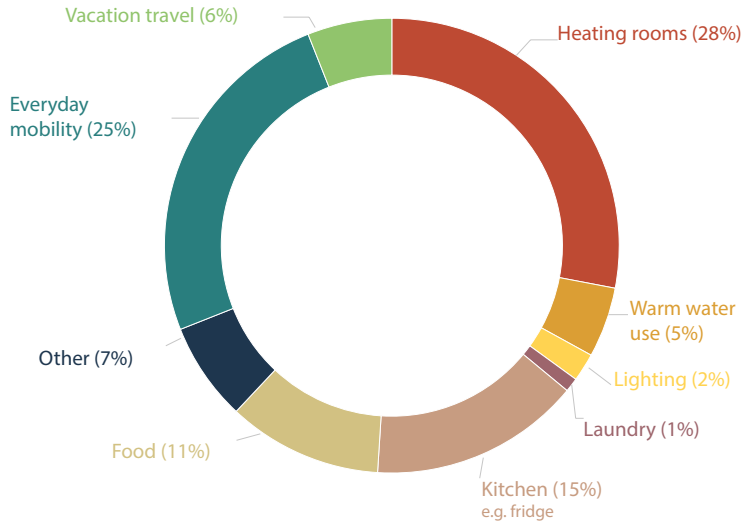
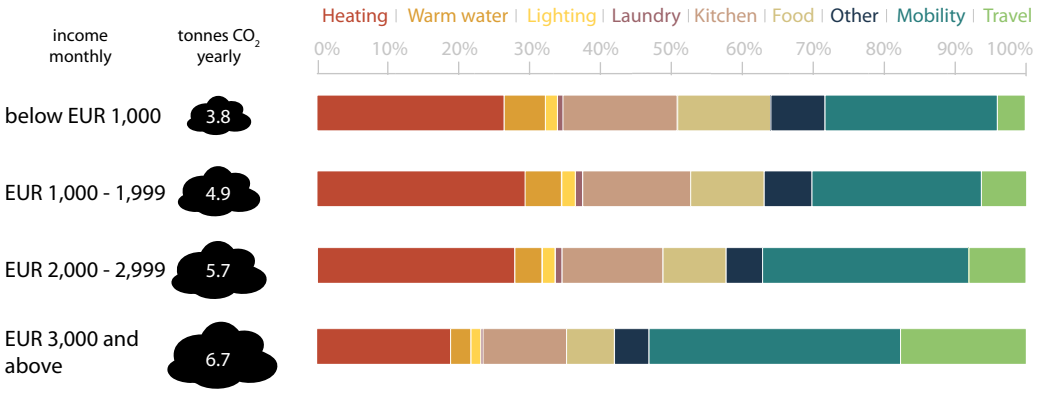


Contribution of different consumption areas to annual per capita CO_2 emissions
(Moser, et al., 2016, Fig.1)



Per capita CO_2 emissions and consumption area shares according to income groups
(Moser, et al., 2016, Fig.2)

Assessment and calculation of overall energy use (example)

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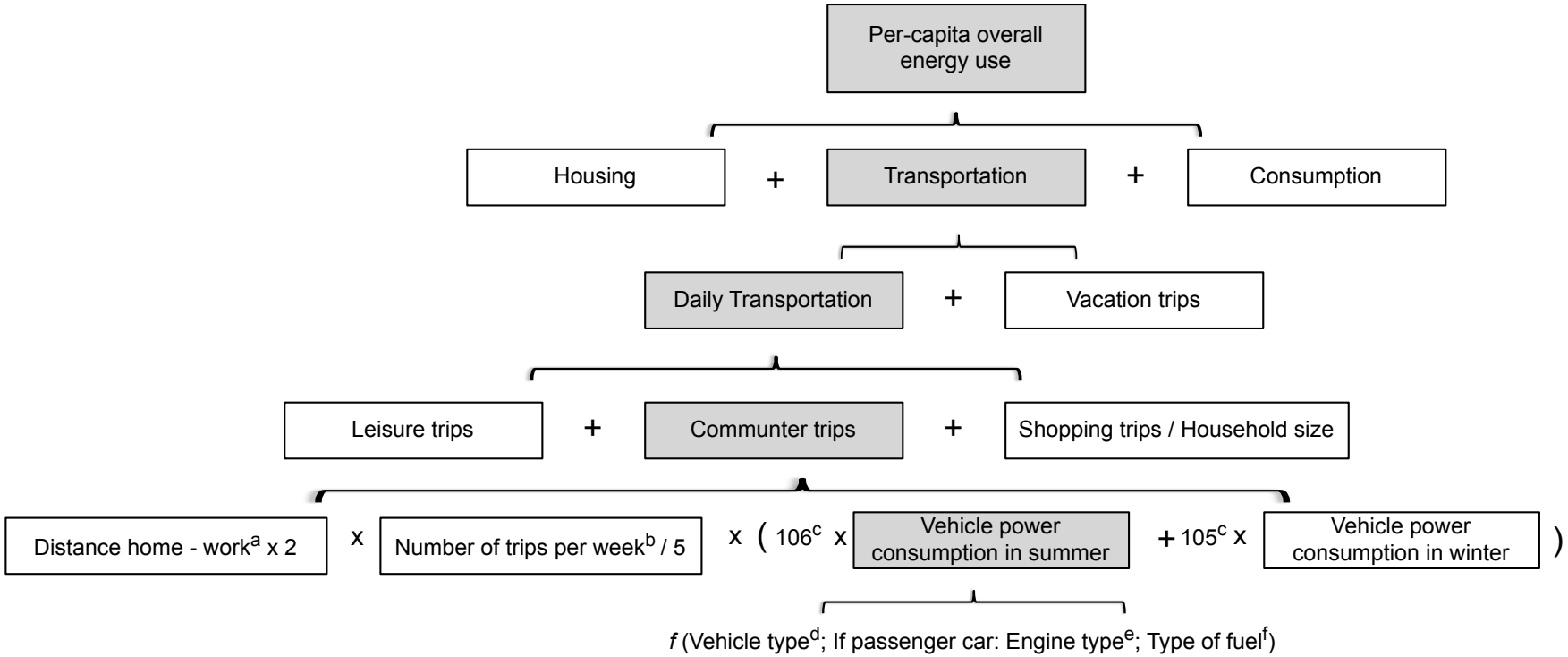

(Moser & Kleinhückelkotten, 2017, Online Appendix)

Assessment of PEB and SI

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Pro-environmental behavior

> "I organize my daily life so as to use as few natural resources as possible"
> "I even try to use as few natural resources as possible when it requires substantial extra costs and effort"

Environmental self-identity

> "I think of myself as a consumer who cares about saving natural resources"
> "A resource-saving lifestyle is an important part of who I am"

5-point scale, ranging from 1 = "I totally agree" to 5 = "I totally disagree"

Interaction between Income and SI

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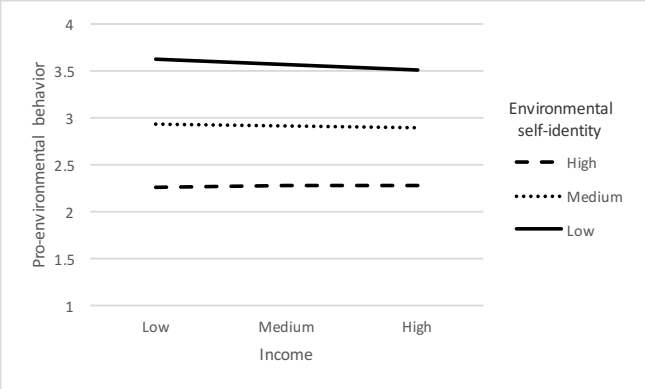

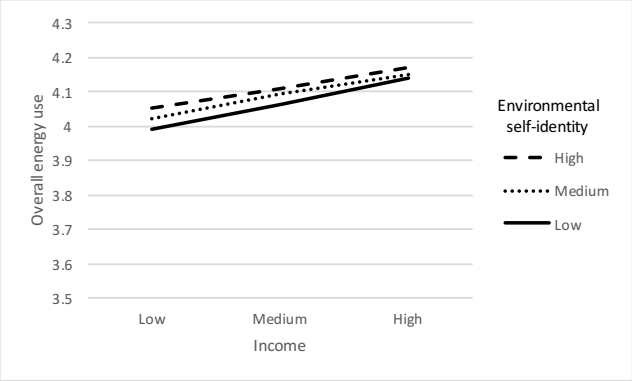

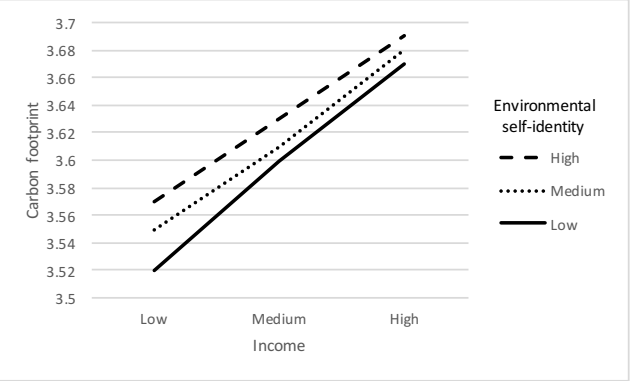

Table C1: *Linear models predicting pro-environmental behavior, overall energy use, and carbon footprint (moderation analysis)*

	Pro-environmental behavior				Overall energy use (kWh/a)				Carbon footprint ($kgCO_2e/a$)			
	B	*S.E.*	*t*	*p*	*B*	*S.E.*	*t*	*p*	*B*	*S.E.*	*t*	*p*
Constant	2.92	.02	140.21	.000	4.09	.01	629.63	.000	3.61	.01	608.57	.000
Env. Self-identity (centered)	.68	.02	29.65	.000	-.02	.01	-3.49	.001	-.02	.01	-3.08	.002
Income (centered)	.00	.00	-1.03	.306	.00	.00	9.06	.000	.00	.00	9.76	.000
Income x Env. Self-identity	-.00	.00	-1.49	.138	.00	.00	.90	.364	.00	.00	1.27	.205
R^2			.51				.13				.14	
N			945				946				946	

Notes. Due to their skewed distribution, overall energy use and carbon footprint were log-transformed.

(Moser & Kleinhückelkotten, 2017, Online Appendix)